

ABSTRACT OF THE DISCLOSURE

A method and apparatus for controlling beam emittance by placing a lens array in a drift space of an illumination system component. The illumination system component may be an electron gun or a liner tube or drift tube, attachable to an electron gun. The lens array may be one or more mesh grids or a combination of grids and continuous foils. The lens array forms a multitude of microlenses resembling an optical "fly's eye" lens. The lens array splits an incoming solid electron beam into a multitude of subbeams, such that the outgoing beam emittance is different from the incoming beam emittance, while beam total current remains unchanged. The method and apparatus permit independent control of beam current and beam emittance, which is beneficial in a SCALPEL illumination system.